

**POLICY ISSUE**  
**(Notation Vote)**

February 22, 2017

SECY-17-0026

FOR: The Commissioners

FROM: Victor M. McCree  
Executive Director for Operations

SUBJECT: POLICY CONSIDERATIONS AND RECOMMENDATIONS FOR  
REMEDATION OF NON-MILITARY, UNLICENSED HISTORIC  
RADIUM SITES IN NON-AGREEMENT STATES

PURPOSE:

The U.S. Nuclear Regulatory Commission (NRC) staff is requesting Commission approval of three recommendations related to the NRC's oversight of the remediation of non-military sites contaminated with radium-226 and NRC fees for remediation activities.

SUMMARY:

The NRC staff informed the Commission in SECY-14-0092, "Staff Efforts for Addressing Decommissioning Issues at Non-Licensed Radium Sites Unaffiliated with the Military" (ML14080A297), that it would begin an effort to identify non-military sites with the potential for radium contamination due to historic use of radium. SECY-16-0020, "Near-Term Actions to Address Non-Military Sites with Potential Radium Contamination" (ML15307A283), provided the results of this effort and described the path forward for notifying the non-Agreement States and site owners, collecting additional site information from the States, and conducting initial site visits and scoping surveys. Based on progress to date, the staff is requesting Commission approval of recommendations regarding three issues associated with the remediation of these

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sites: 1) the NRC's role with respect to sites in non-Agreement States that are being remediated under the U.S. Environmental Protection Agency (EPA) Brownfields Program (e.g., portions of the Waterbury Clock Company site in Connecticut); 2) regulatory approaches for oversight of remediation of radium contamination at sites in non-Agreement States; and 3) NRC fees for remediation activities at these sites. In addition, the staff is providing information to the Commission regarding ongoing work on two items related to remediation at sites where site owners do not have sufficient funds to cover cleanup costs and use of restricted release or alternate decommissioning criteria in certain circumstances.

#### BACKGROUND:

The Energy Policy Act of 2005 (EPAct) amended the Atomic Energy Act of 1954 (AEA) to expand the definition of byproduct material to include certain discrete sources of radium-226 that are produced, extracted, or converted for a commercial, medical, or research activity; other discrete sources of naturally-occurring radioactive material; and certain accelerator-produced radioactive material (collectively, these materials are referred to as Naturally-Occurring or Accelerator-Produced Radioactive Material (NARM)). On November 30, 2007, the NRC amended its regulations to reflect this revised definition of byproduct material: "Requirements for Expanded Definition of Byproduct Material" (72 *Federal Register* (FR) 55864; October 1, 2007) (NARM rule).<sup>1</sup> Further, this rulemaking defined the term "discrete source." The Statements of Consideration (SOCs) for the NARM rule noted, "once a discrete source meets the definition of *byproduct material*, any contamination resulting from the use of such discrete sources of this byproduct material will also be considered byproduct material." *Id.* at 55,871.

As discussed in SECY-14-0092, the NRC staff contracted with Oak Ridge National Laboratory (ORNL) to identify non-military sites in non-Agreement States with the potential for radium contamination. In SECY-16-0020, the NRC staff informed the Commission of the results of the ORNL effort and the staff's plans to: 1) work with States to gather additional site information; 2) conduct initial site visits and scoping surveys to assess the radiological status of the sites; and 3) evaluate whether the sites require remediation to meet the NRC's unrestricted use criterion of 25 millirem per year.<sup>2</sup> Based on progress to date in the program and the staff's analysis, this paper provides the staff's recommendations specific to the NRC's role at non-military sites in non-Agreement States where radium contamination exists and the fee issues associated with regulatory oversight of site remediation activities.

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<sup>1</sup> Many states had regulatory programs for NARM prior to the implementation of the EPAct. Subsequent to the EPAct and the NARM rule, the NRC completed the phased implementation of its regulatory authority for radium in 2009 for all non-Agreement States. Each Agreement State has regulatory authority for radium within its borders. However, in general, radium was not regulated at the time the sites under consideration were operating.

<sup>2</sup> The ORNL report identified 29 non-military sites in non-Agreement States with the potential for radium contamination. This list is not exhaustive and is expected to change as staff acquires additional information. For example, the staff recently informed the Commission of seven additional sites identified during ongoing discussions with non-Agreement States. The staff intends to treat these sites consistent with the Commission's direction with respect to this matter. Some of these site owners may qualify as general licensees under Title 10 of the *Code of Federal Regulations* (10 CFR) § 31.12, "General License for Certain Items and Self-Luminous Products Containing Radium-226," which provides for issuance of a general license for certain items and self-luminous products containing radium-226. These general licensees will not be included in the sites addressed through the program discussed in this paper.

## DISCUSSION:

### NRC's Role at Sites in Non-Agreement States Under the EPA Brownfields Program

The EPA Brownfields Program may provide a potential funding mechanism for sites with historical radium contamination requiring characterization and remediation. The NRC staff recommends that the Commission approve a monitoring approach for sites in this program to avoid disruption of potential remediation of the sites to protect the public while ensuring that the NRC retains a role in the remediation process.

A Brownfield site is real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.<sup>3</sup> The EPA Brownfields Program empowers states, communities, and other stakeholders involved in economic redevelopment to work together in a timely manner to assess, safely clean up, and sustainably reuse properties within the Brownfields Program.<sup>4</sup> The program accomplishes this by providing direct funding through four types of grants: assessment, cleanup, revolving loan funds (RLF), and environmental job training.<sup>5</sup>

The four grants have different functions and requirements. Generally, eligible entities are defined based on the type of grant requested. For example, eligible entities for assessment and RLF grants include State, Tribal (with the exception of Indian Tribes in Alaska), and local governments,<sup>6</sup> as well as several other government entities such as redevelopment agencies created or sanctioned by a State.<sup>7</sup> Eligible entities for cleanup grants include the same government entities eligible for assessment and RLF grants, as well as non-profit organizations and educational institutions.<sup>8</sup> For-profit organizations are not eligible for EPA Brownfields grant funding, but can form partnerships with and receive grant funds from an eligible entity to provide assistance for Brownfields remediation.<sup>9</sup>

The assessment grant program provides funding for inventory, characterization, assessment, and planning related to Brownfield sites.<sup>10</sup> The cleanup grant program provides funding for

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<sup>3</sup> 42 U.S.C. 9601(39)(A).

<sup>4</sup> U.S. Environmental Protection Agency, Brownfield Overview and Definition, <https://www.epa.gov/brownfields/brownfield-overview-and-definition> (last updated Aug 3, 2016).

<sup>5</sup> U.S. EPA, Types of Brownfield Grant Funding, <https://www.epa.gov/brownfields/types-brownfields-grant-funding>.

<sup>6</sup> For purposes of the EPA Brownfields Grant Program, a "local government" is defined under 2 CFR 200.64, "Local Government," to mean, "a county, municipality, city, town, township, local public authority (including any public and Indian housing agency under the United States Housing Act of 1937), school district, special district, intrastate district, council of governments (whether or not incorporated as a nonprofit corporation under state law), any other regional or interstate government entity, or any agency or instrumentality of a local government."

<sup>7</sup> 42 U.S.C. 9604(k)(1).

<sup>8</sup> 42 U.S.C. 9604(k)(3)(A)(ii).

<sup>9</sup> 42 U.S.C. 9604(k)(3)(B).

<sup>10</sup> 42 U.S.C. 9604(k)(2); U.S. EPA, Assessment Grants, <https://www.epa.gov/brownfields/types-brownfields-grant-funding#tab-1>.

direct remediation of one or more Brownfield sites.<sup>11</sup> RLF grants provide funding for a grant recipient to capitalize a RLF and provide sub-grants to carry out cleanup activities at Brownfield sites.<sup>12</sup> Finally, funding for environmental job training is available to facilitate employment for predominantly low-income and minority, unemployed and under-employed, people living in areas affected by solid and hazardous waste.<sup>13</sup>

The Brownfields Program relies on local and State regulatory agencies to oversee assessment and remediation activities. Under the Brownfields Program, the EPA maintains a limited oversight role, but State and local governments have the main oversight responsibility for remediation activities. The State and local government roles vary and are determined on a case-by-case basis.<sup>14</sup>

The staff evaluated three options for the NRC's role at sites in the Brownfields Program: 1) enter into a Memorandum of Understanding (MOU) with the EPA and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate, under which the NRC would assume a monitoring role; 2) treat these sites the same as those not in the Brownfields Program; or 3) let site remediation activities proceed under the Brownfields Program with no NRC involvement. The NRC staff recommends the first option, monitoring current and future<sup>15</sup> Brownfields remediation activities at non-military sites in non-Agreement States, by establishing an MOU with the EPA and a separate site-specific agreement with the involved State or local government, as appropriate. NRC monitoring would be similar to the approach the Commission approved in Staff Requirements Memorandum (SRM)-SECY-14-0082, "Jurisdiction for Military Radium and the U.S. Nuclear Regulatory Commission Oversight of U.S. Department of Defense Remediation of Radioactive Material" (ML14097A005), for the NRC's involvement at sites contaminated with military radium which are being remediated under the Comprehensive Environmental Response, Compensation, and Liability Act process without EPA oversight. In addition to establishing an MOU between the NRC and the EPA and a separate site-specific agreement with State or local governments, the NRC staff recommends forbearing licensing as long as the site owner cooperates and achieves remediation to protect public health and safety. This aspect of the recommended approach would be explained to site owners through correspondence (i.e., letter of forbearance). The monitoring approach would avoid duplicative or conflicting cleanup requirements, while also ensuring that the NRC fulfills its role under the AEA of protecting public health and safety.

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<sup>11</sup> 42 U.S.C. 9604(k)(3)(a)(ii); U.S. EPA, Cleanup Grants, <https://www.epa.gov/brownfields/types-brownfields-grant-funding#tab-3>.

<sup>12</sup> 42 U.S.C. 9604(k)(3)(a)(i); *see also*, U.S. EPA, Revolving Loan Fund (RLF) Grants, <https://www.epa.gov/brownfields/types-brownfields-grant-funding#tab-2>.

<sup>13</sup> U.S. EPA, Environmental Workforce Development and Job Training, <https://www.epa.gov/brownfields/types-brownfields-grant-funding#tab-6>.

<sup>14</sup> States are authorized to establish their own Brownfields grant program, independent of the EPA program, and the EPA may award a grant to a State that has such a program that meets certain criteria. See 42 U.S.C. 9628. State Brownfields programs may provide a separate funding mechanism, but this option is not discussed as part of the staff's recommendation to the Commission.

<sup>15</sup> For sites identified that are in the process of obtaining an EPA Brownfields grant or those that apply for one in the future, the staff intends to wait until a decision has been made by the EPA Brownfields Program before pursuing further licensing action at those sites.

The recommended monitoring approach would include document reviews, site observations, independent dose assessments, and confirmatory surveys to ensure that the NRC's 25 millirem per year (mrem/yr) decommissioning dose criteria is not exceeded and occupational workers and the public (including non-occupational workers onsite) are protected in accordance with the dose limits in 10 CFR Part 20, "Standards for Protection Against Radiation." Service providers involved in cleanup activities and who therefore would be handling radioactive material, would operate under an NRC or Agreement State license. Although the NRC's decommissioning process would not be used, because a license is not involved, the staff's recommended monitoring approach is consistent with the NARM Rule SOCs because it presents an alternative to licensing these sites that adequately protects the public (72 FR 55902). Under the proposed approach, the NRC would retain the ability to exercise its authority if the cleanup does not meet the NRC's 25 mrem/yr dose criteria for unrestricted release. As discussed in further detail in Enclosure 1, the NRC staff's recommended monitoring approach would not disrupt the ongoing Brownfields-funded remediation activities.

The staff is sensitive to fairness concerns and the financial difficulty that may be presented to owners of sites with historical radium contamination. The EPA Brownfields Program provides eligible entities an opportunity to seek funding for assessment and remediation of contaminated sites. The NRC staff recommends the monitoring approach because it effectively and efficiently accomplishes successful remediation that protects the public while allowing for appropriate NRC engagement in the remediation process.

If this approach were approved by the Commission, the staff would work with EPA to inform site owners about the Brownfields Program. Although the Brownfields Program may only assist a limited number of site owners, the staff considers the monitoring approach to be beneficial for any sites that are able to receive cleanup funding through the Brownfields Program.

The former Waterbury Clock Company site, a privately-owned complex of buildings located in Waterbury, Connecticut, is an example of a non-military, radium contaminated site located in a non-Agreement State where the owner for portions of the site has received a grant for remediation under the Brownfields Program. Multiple private entities own portions of the former Waterbury Clock Company complex. The site has historical contamination from radium-dial painting that occurred between 1919 and the 1930s. The portions of the site in the Brownfields Program are owned by New Opportunities, Inc.<sup>16</sup> If the Commission approves the recommended monitoring approach, the staff would work closely with the site owner, EPA, and State or local government officials to cleanup those portions of the Waterbury Clock Company site that are subject to the Brownfields Program.

#### Regulatory Approach for Remediation of Sites with Radium Contamination that Are Not Involved in the EPA Brownfields Program

In addition, the NRC is pursuing action at sites identified in non-Agreement States with the potential for radium contamination that are not under the EPA Brownfields Program. The NRC's

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<sup>16</sup> New Opportunities, Inc. is a non-profit community action agency that provides social service programs to communities in Connecticut. New Opportunities also owns other portions of the site that are not being cleaned up under the Brownfields Program.

current understanding of these sites indicates a wide range of site conditions, which could lead to a variety of remedial approaches.<sup>17</sup>

The NRC staff evaluated two options for remediation of these sites: 1) taking a risk-informed, graded approach to license sites only when more significant levels of contamination are present, or 2) licensing all sites with contamination. The staff recommends that the Commission approve the first option. This option is consistent with the Commission's position in the NARM Rule SOCs in that it protects the public and provides an alternative to licensing all historic radium sites (72 FR 55902). Under this approach, the dose assessment results at each site and the site owner's willingness to cooperate with the NRC would be the factors considered by the NRC staff in determining the appropriate course of action, i.e., unrestricted use, letter of forbearance, or licensing. Dose assessments would be developed based upon the data collected during the initial site visit and scoping survey (if needed), as described in the Temporary Instruction 2800/043, "Inspection of Facilities Potentially Contaminated with Discrete Radium-226 Sources" (ML16035A053).

The staff's assessment of potential doses at each site would dictate the following staff actions:

- **Less than 25 mrem/yr (unrestricted use criterion dose limit):**
  - No controls or remediation are necessary and no further NRC actions are needed.
  - A letter from the NRC to the site owner would document the NRC's finding that there is reasonable assurance the site meets the criteria in 10 CFR § 20.1402 for unrestricted use.
- **Greater than 25 mrem/yr but less than the 100 mrem/yr public dose limit:**
  - Remediation may be required;
  - Discuss controls for radiation protection on a site-specific basis;
  - Issue letter of forbearance to the site owner if the owner agrees to any necessary controls and remediation consistent with NRC requirements; and
  - Licensing if site owner does not agree to controls or remediation.
- **Greater than the 100 mrem/yr public dose limit:**
  - Consider licensing to require controls and remediation.

A letter of forbearance for cooperative owners would document that the owner understands and agrees to interim controls on access and use until remediation is completed. This letter would also clarify that the NRC intends to forgo licensing of the site as long as the site owner abides by the terms and conditions of the letter. Due to the variability in site-specific circumstances, the staff would determine the terms and conditions of these letters on a case-by-case basis. This approach would ensure that potential doses are within the limits in 10 CFR Part 20 and remediation is consistent with the NRC's unrestricted release decommissioning requirements.<sup>18</sup>

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<sup>17</sup>SECY-16-0020 includes descriptions of 29 sites in non-Agreement States where radium was historically used, along with plans for collecting additional information to determine if implementing immediate controls and eventual remediation of these sites is warranted; since that time staff has identified seven additional sites that need to be evaluated.

<sup>18</sup> The staff proposes to address sites where restricted release would be used on a case-by-case basis.

Where a letter of forbearance to the owner is used, the NRC would monitor the owner's interim controls and remediation efforts through oversight activities similar to those used at licensed sites, such as document reviews, site observations (e.g., inspections), dose assessments, and selective confirmatory surveys or observation of contractor surveys. The remediation contractors would be the NRC or Agreement State service-provider licensees, as required by NRC's regulations, which would ensure that decommissioning activities are conducted safely.

As noted in the Temporary Instruction governing scoping surveys referenced above, a scoping survey may not be needed at all sites. In some circumstances, the NRC staff may be able to gather sufficient information during the initial site visit and make a conservative dose assessment, eliminating the need for a follow up survey. There may also be instances where the staff, because of the conditions present at the site, will be unable to gather additional information about the potential dose during a follow up scoping survey. In these situations, the staff will make a determination on dose based on available data. The staff intends to use available data to develop a dose assessment and intends to revise dose conclusions and site categorization when additional information, such as the results of full characterization by the site owner, becomes available.

The staff recommends the graded approach described above because it provides flexibility to address the diversity of sites that may need remediation, while limiting the use of licensing to sites for which the dose due to the radium contamination is above the public dose limit, or where the owners are unwilling to take necessary steps to protect public health and safety in accordance with 10 CFR Part 20 dose limits. This approach is also generally consistent with the NARM Rule SOC discussion about not licensing historic radium sites, and it is in alignment with the NRC's actions under the Formerly Licensed Sites Program.<sup>19</sup> The staff considers this more flexible approach appropriate because it ensures controls necessary to protect the public health and safety and takes into consideration the limited funding site owners may have, in that it uses available funding for site remediation rather than impose licensing costs.

### NRC Fees

Materials sites undergoing decommissioning do not pay annual Part 171 fees. See 10 CFR § 171.16(d)(14)(b). Typical licensed decommissioning sites do, however, pay Part 170 user fees for any site-specific decommissioning oversight activities that the NRC performs, unless that site applies for and receives an appropriate fee exemption. None of the historic owners for the sites that are the subject of this Commission paper have possessed an NRC or Atomic Energy Commission license for the radium contamination. Most of the current site owners did not even use radium on the site; the remaining radium or contamination is the result of past activities by prior owners. Therefore, the staff evaluated two options: 1) require current

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<sup>19</sup> Prompted by General Accounting Office audits in 1976 and 1989, the NRC staff's Formerly Licensed Sites Program involved the review of terminated license files to determine whether facilities were properly decommissioned, and remediation was pursued, where appropriate. See SECY-97-188 *Formerly Licensed Sites Identified for Further Investigation in Agreement States* (Aug. 18, 1997) (Agencywide Documents Access and Management System Accession No. ML992930028). The NRC did not license all sites decommissioned under this program. For example, see AAR Site, Livonia, Michigan, 80 Fed. Reg. 60,719, 60,720 (Oct. 7, 2015).

owners to pay user fees under 10 CFR Part 170 for oversight activities, or 2) establish a new decommissioning fee relief category and not charge current owners fees for oversight activities.

The NRC staff recommends that the Commission approve the second option—not charging Part 170 user fees for oversight activities and creating a new fee-relief category to encompass the NRC staff's work for these sites. First, the site owners may lack sufficient funds to clean up the site and pay NRC user fees. Requiring those owners to apply for fee exemptions would place a significant burden on them to develop, and a corresponding burden on the NRC staff to evaluate, the requests, in addition to adding another impediment to remediation by increasing costs to the site owner who may not have sufficient funds for remediation. If the Commission decides to create a new fee-relief category, then the NRC staff resources associated with implementation of the non-military radium program, will go entirely into fee-relief.<sup>20</sup>

#### *Additional Items for Commission Awareness*

##### Funding for Remediation when Owners Lack Sufficient Funds

Based on previous NRC experiences with unlicensed sites, funding for successful remediation of historic radium sites in accordance with NRC standards could be a major challenge for site owners. Under NRC's regulations, if someone possesses byproduct material, he or she is responsible for the decommissioning and disposal of this material (for example see 10 C.F.R. § 30.3, "Activities requiring license"). Absent statutory authority, the NRC is not itself authorized to spend appropriated funds for site remediation purposes. Therefore, absent some other source of funding, current site owners are responsible for the costs of remediation. Some owners may not have sufficient funds available for site remediation or, even if sufficient funds are available, may be unwilling to pay for remediation costs because many of the current site owners were not responsible for, nor aware of, the potential contamination on their site. The NRC has limited ability to compel owners without sufficient funds to remediate. Previous owners, many of whom are no longer viable business entities, were responsible for the contamination. Even if these past owners still exist, the NRC does not have the authority to require them to pay for remediation. Moreover, because none of these sites were ever licensed, there are no separate funding sources available for decommissioning (i.e., there were no financial assurance requirements for these sites). Thus, other sources of funding must be obtained, which will dictate, at least in part, the schedule for initiating and completing remediation. To help address these funding issues, site owners may seek additional funds from entities like the EPA, the State, and other Federal agencies.

The NRC staff plans to work with site owners to explore other funding options for those cases where the owners do not have sufficient funds to complete site remediation. The NRC's decommissioning program has a long history of working with entities that do not have sufficient funding for remediation, and the staff's experience may lead to solutions regarding the costs of site cleanup. The staff has considered decommissioning issues in other contexts, as discussed in the Commission papers listed below:

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<sup>20</sup> If the total budgeted resources for all fee-relief categories exceeds 10 percent of the agency's total budget, then the NRC will impose a surcharge that will be spread to all licensees' annual fees in the fee rule (for example, see Revision of Fee Schedules; Fee Recovery for Fiscal Year 2015, 80 Fed. Reg. 37,432, 37,432 (June 30, 2015)).



- SECY-00-0180, "Issues and Funding Options to Facilitate Remediation of Decommissioning Sites in Non-Agreement States" (ML003723273), provided the Commission with an analysis of issues involving both formerly licensed sites and currently licensed sites where future funding of decommissioning might be difficult. The issues addressed in the subject analysis included: NRC statutory authority to remediate, NRC authority to hold and provide funds for remediation, and criteria for determining owner financial capability and need for Federal funding of remediation.
- SECY-02-0008, "Status Report on Developing a Memorandum of Understanding with the U.S. Department of Energy for a Decision Process Regarding Potential Site Transfers Under Section 151(b) of the Nuclear Waste Policy Act" (ML012890367), included a revision to the criteria for determining owner financial capability and the need for Federal funding for remediation that was requested by the Commission as a follow up to SECY-00-0180.

As discussed in these Commission papers, the staff evaluated issues relevant to funding for the cleanup of historic radium sites including: criteria for determining when an owner has insufficient funds for cleanup; the NRC's role in providing grants to State or Federal entities for remediation activities; and criteria for requesting authorization and appropriation of funds in support of NRC-directed State or Federal cleanup efforts. As documented in the associated SRMs, the Commission provided the staff with direction on how best to proceed in addressing the unique circumstances at that time. Should the staff find that current site owners have insufficient funding for necessary remediation, the staff will refer to its previous evaluation of the relevant issues and associated Commission direction, as it explores potential funding options for site owners with insufficient funds and provide recommendations to the Commission, as appropriate. Depending on the number of site owners with insufficient funding, it may be necessary to request Congressional action to resolve the matter of sites that cannot be remediated through existing programs. If necessary, the staff will provide specific recommendations to the Commission after sufficient information is obtained regarding contamination of the sites, remediation plans and costs, and the availability of funding.

In certain cases, the lack of sufficient funding may result in significant delays in the completion of site remediation. In these circumstances, the staff would work with site owners and local governments on a case-by-case basis to maintain controls at the site. Further, the staff would provide the owners with additional information about funding options that may be available through local or State government, or Federal programs like the EPA Brownfields Program.

For instances where site owners are unwilling to work cooperatively with the NRC to remediate their sites, the staff will address these instances on a case-by-case basis. This may include the issuance of orders to require the site owner to obtain a license and enforcement action, when appropriate.

The Use of Restricted Release or Alternate Decommissioning Criteria in Certain Circumstances

If restricted release or the use of the alternate decommissioning criteria should be considered, the staff will prepare a separate Commission paper with specific recommendations for these sites consistent with 10 CFR § 20.1404(b), "Alternate Criteria for License Termination."

Under the restricted release or alternate decommissioning criteria approach, institutional controls (ICs) can be used to restrict future site uses instead of requiring cleanup to unrestricted use levels. For example, ICs could prohibit future residential use of the site, and instead allow only industrial use that would permit a higher cleanup level and hence lower remediation cost. The EPA Brownfields Program has included this restricted release approach. More specifically, under this approach, contamination could remain onsite with doses greater than 25mrem/yr as long as ICs in effect would limit doses to 25 mrem/yr, and the remaining contamination onsite is As Low As is Reasonably Achievable (i.e., consistent with the restricted release eligibility requirements in 10 CFR § 20.1403(a), "Criteria for License Termination Under Restricted Conditions," or the alternate release criteria in 10 CFR § 20.1404, "Alternate Criteria for License Termination").

RECOMMENDATIONS:

The staff recommends that the Commission approve:

1. NRC monitoring under an MOU and a separate site-specific agreement at sites undergoing remediation through the EPA Brownfields Program.
2. Use of a risk-informed, graded approach to either license, work cooperatively with site owners using a letter of forbearance, or not pursue any further action.
3. Establishment of a new NRC fee-relief category for non-military sites contaminated due to historic uses of radium.

RESOURCES:

Enclosure 2 includes an estimate of the resources consistent with those outlined in SECY-16-0020.

STATE COORDINATION:

The NRC staff will continue to coordinate and exchange information with non-Agreement States about its approach and results. The NRC shared lessons learned with its Agreement State partners through the Organization of Agreement States and continues to coordinate on non-military radium issues.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper relative to both the fee-relief issue and resource implications, and has no objections.

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Enclosures:

1. Non-Military Radium Site Conditions  
and Evaluation of Options
2. Resources (non-public)

Policy Considerations and Recommendations for Remediation of Non-Military, Unlicensed  
Historic Radium Sites in Non-Agreement States Dated: February 22, 2017.

**ADAMS Accession No.: ML16295A341 (package)****\*via email**

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## **Non-Military Radium Site Conditions and Evaluation of Options**

### *Evaluation of Options for U.S. Nuclear Regulatory Commission Involvement with Ongoing Remediation under the U.S. Environmental Protection Agency Brownfields Program*

There are three options for the U.S. Nuclear Regulatory Commission (NRC) involvement with the ongoing remediation of the sites in the Brownfields Program: 1) enter into a Memorandum of Understanding (MOU) with the U.S. Environmental Protection Agency (EPA) and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate, under which the NRC would assume a monitoring role, 2) treat these sites the same as those not in the Brownfields Program, or 3) let site remediation activities proceed under the Brownfields process with no NRC involvement. All three options are discussed below.

The staff recommends that the Commission approve a "monitoring" approach for sites undergoing remediation through the Brownfields Program. This approach is similar to the approach approved by the Commission for the cleanup of military sites contaminated with radium. A "stay informed" approach under an MOU was approved by the Commission for the NRC's involvement in the remediation of any U.S. Department of Defense (DoD) site with unlicensed Atomic Energy Act (AEA) material through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and with EPA regulatory oversight (SRM-SECY-14-0082). In accordance with the MOU, the NRC uses a monitoring approach where the NRC provides limited oversight through site observations, independent dose assessments, and confirmatory surveys for DoD remediation under the CERCLA process at sites without EPA oversight. The EPA's limited oversight role under the Brownfields remediation process is not the same as the more significant regulatory oversight role the EPA exercises during DoD remediation under the CERCLA process. Therefore, due to the EPA's more limited oversight role at Brownfields sites compared to CERCLA sites, the staff recommends the use of a monitoring approach for sites undergoing remediation through the Brownfields Program to assure consistent Federal oversight.

#### Evaluation of Options Regarding NRC's Involvement at Sites under the EPA Brownfields Program

Option 1: The NRC monitors the ongoing Brownfields Program remediation under an MOU with EPA and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate.

Under this option, the NRC would monitor remediation activities under the Brownfields Program through an MOU with the EPA and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate. This MOU would be signed by the Office of Nuclear Material Safety and Safeguards Office Director, or designee, as appropriate. The NRC would work cooperatively with the involved site owner through a letter of forbearance. Monitoring could include document reviews, site observations, independent dose assessments, and confirmatory surveys to ensure that the NRC's 25 millirem per year (mrem/yr) dose criteria under Title 10 of the *Code of the Federal Regulations* (10 CFR) § 20.1402 and 10 CFR § 20.1403 are not exceeded. The NRC would coordinate its monitoring activities and

survey results with the State or local government, as appropriate. Prior to the site being released, the site owner would need to successfully demonstrate to the NRC that the cleanup level does not exceed 25 mrem/yr. If the Brownfields Cooperative Agreement between EPA and the site owner expires without the site owner having successfully demonstrated that doses do not exceed the 25 mrem/yr dose criteria, then the NRC would treat this site similar to other sites with historical radium contamination.

- Pros:
  - This approach is similar to the current Commission-directed policy of using a monitoring approach with respect to DoD remediation of military radium sites under the NRC-DoD MOU.
  - This approach is a cooperative way to work with the EPA as well as State and local governments under the Brownfields Program while using EPA funding to achieve the goal of site remediation that is acceptable to all parties.
  - This approach is consistent with the approach outlined by the NRC in the Naturally-Occurring or Accelerator-Produced Radioactive Material (NARM) Rule Statements of Consideration (SOC).
  - This approach allows the NRC to retain the ability to consider licensing the site if the cleanup does not meet the NRC's 25 mrem/yr dose criterion.
  - This approach avoids duplicative or conflicting cleanup requirements.
  - This approach avoids possible confusion from the involvement of two regulatory agencies.
  - The State and local governments would have the benefit of NRC experience with this approach.
- Cons:
  - This approach could create the perception that the NRC is relying on the EPA as well as State and local governments instead of taking responsibility to resolve the issue with non-military radium contamination.
  - This approach would require NRC action if remediation results do not meet NRC standards or if funds are insufficient to complete cleanup of the entire site.
  - For each site entering into the Brownfields Program that is located in a different locality, this approach would require the NRC to coordinate separately with that EPA region and State and local government, as appropriate.

Option 2: Do not rely on the Brownfields Program and treat all the sites the same.

This option would require site owners to work directly with the NRC and potentially apply for and receive an NRC license to continue remediation.

- Pros:
  - This approach is consistent with the NRC's approach for decommissioning of other sites with historical radium contamination, i.e., non-Brownfields radium sites.
  - This approach would use NRC's decommissioning process for the remediation.

- Cons:
  - This approach would disrupt EPA-funded cleanups and could require the site owners to find an alternate source of funding to complete the remediation.
  - The NRC could be viewed negatively by the community as well as local and State governments for disrupting an ongoing process that has taken time and effort to establish.
  - This approach may create conflicting clean-up standards and dual regulation.

Option 3: Let site remediation activities proceed under the Brownfields Program with no NRC involvement.

- Pros:
  - This approach reduces NRC resource expenditures.
- Cons:
  - This approach relies completely on EPA as well as State and local government oversight, which may not be equivalent to NRC oversight or adequate to meet AEA standards.
  - This approach could create uncertainty about liability for future owners because current owners might be concerned about the potential for the NRC to reopen the completed Brownfields remediation.
  - This approach could create the perception that the NRC is not taking responsibility for sites under its jurisdiction.

For all three options, the NRC would regulate contractors under an NRC or Agreement State service provider license to ensure controls are in place to restrict public access to the site and to ensure that remediation activities are conducted safely. The staff would apply the Commission's decision on NRC involvement with the Brownfields Program to existing sites, like the Waterbury Clock Company site.

*Evaluation of Options for Interim Controls and Remediation at Historic Non-Military Radium Sites not involved in the Brownfields Program*

Background

The primary issue addressed in this discussion is how to ensure controls and remediation applicable to the range of conditions expected for the sites. The NRC contemplated how to deal with unlicensed sites in the SOCs for the NARM rule (72 *Federal Register* 55,864; October 1, 2007):

NRC does not intend to require non-licensed owners of properties that may be contaminated with radium-226 to obtain licenses. If contamination is discovered at a non-licensed person's facility, such as contaminated buildings or grounds, the NRC will work with the facility owner to perform decommissioning of the site. If the site presents a significant threat to the public health and safety, the NRC may order the owner to obtain a license and to perform decommissioning of the site.

The staff evaluated two options: 1) taking a risk-informed, graded approach to license sites only when more significant levels of contamination are present, or 2) licensing all sites with contamination. Both options are discussed below.

The staff recommends that the Commission approve a graded approach whereby doses greater than the public dose limit of 100 mrem/yr would be a threshold for NRC staff to consider licensing a site. The NRC staff does not consider this 100 mrem/yr limit to indicate a significant threat or concern with respect to public health and safety, rather, the staff considers sites above that threshold to represent a greater concern when compared to sites with lower doses. Site owner cooperation would also be a factor in determining the appropriate approach (i.e., licensing or using a letter of forbearance).

#### Detailed Evaluation of Options Regarding Controls and Remediation

##### Option 1. Use a risk-informed, graded approach.

The NRC staff would work with the site owner to ensure site cleanup, and where the owners are cooperative, the staff would not require the owners to obtain a license. A letter of forbearance with an unlicensed owner could be used for privately-owned residences, small businesses, or non-profit organizations where the owners are generally cooperative and agree to controls and remediation consistent with the NRC decommissioning dose requirement of 25 mrem/yr for unrestricted use.<sup>1</sup> The NRC would work with the site owners to develop a decommissioning schedule for the site that would balance protection of public health and safety with the owner's financial ability to fund site remediation. For sites remediated under this option, the owner would use NRC or Agreement State service provider licensees to conduct remediation consistent with NRC's requirements and guidance. As discussed above, NRC staff would consider licensing a site where recorded doses are above 100 mrem/yr. The NRC staff would not require remediation at sites with doses that currently meet the NRC's criterion for unrestricted use (i.e., less than 25 mrem/yr).

- **Doses less than 25 mrem/yr:** No controls or remediation are necessary and no further NRC actions are required; an NRC letter to the owner would document the NRC's finding in this regard.
- **Doses greater than 25 mrem/yr but less than 100 mrem/yr:** Remediation may be required; letter of forbearance to the site owner would document that the owner agrees to remediate the site consistent with NRC requirements; the NRC would discuss radiation protection controls on a site-specific basis; licensing would be pursued if the site owner does not agree to remediation.
- **Doses greater than the 100 mrem/yr:** Consider licensing to require both controls and remediation.
- Pros:
  - This graded approach is flexible and provides options for the range of contamination that may be encountered at the different sites.

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<sup>1</sup> As discussed in the Commission paper, pursuit of restricted release or alternative decommissioning criteria may be appropriate in certain circumstances and would be evaluated on a case-by-case basis.



- This approach is generally consistent with the SOCs discussion in the NARM Rule about not licensing historic sites.
  - This approach would allow cleanup to the NRC's decommissioning requirements.
  - This approach is generally in alignment with the NRC's activities under the Formerly Licensed Sites Program.
- Cons:
    - This approach is inconsistent with the NRC's typical decommissioning approach of licensing sites.
    - Although this approach would not relinquish any NRC authority, it likely would be more cumbersome to monitor and enforce the agreed-upon controls and remediation.

#### Option 2: Licensing for all sites

The NRC staff would issue licenses for all of the sites with doses above 25 mrem/yr and require immediate controls and the eventual remediation of the site.

- Pros:
  - This approach is consistent with NRC regulations.
  - Under this approach, enforcement of the interim controls and remediation activities would be more straightforward.
- Cons:
  - Site owners may not have adequate funds, and licensing would not contribute to completing remediation.
  - Forced licensing would only add to the challenges of working cooperatively with the site owner.
  - This approach is inconsistent with the SOCs in the NARM Rule.